Line dilations centered at origin
- Keep the slope
- multiply scale factor and b

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Geometry

Line Dilations Centered at the Origin

1. The line $y = 2x - 6$ is dilated by a scale factor of -3 and centered at the origin. Write an equation of the line that represents the image of the line after the dilation.

$m=2$
$b=-3(-6)=18$ $\quad y=2x+18$

2. The line $y = \frac{1}{2}x - 2$ is dilated by a scale factor of $\frac{5}{2}$ and centered at the origin. Write an equation that represents the image of the line after the dilation.

$m=\frac{1}{2}$
$b=\frac{5}{2}(-2)=-5$ $\quad y=\frac{1}{2}x-5$

3. The line $y = 4x$ is dilated by a scale factor of $\frac{1}{2}$ and centered at the origin. Write an equation that represents the image of the line after the dilation.

$m=4$
$b=\frac{1}{2}(0)=0$ $\quad y=4x$

4. The line $y = -2x + 4$ is dilated by a scale factor of $\frac{5}{2}$ and centered at the origin. Write an equation that represents the image of the line after the dilation.

$m=-2$
$b=\frac{5}{2}(4)=10$ $\quad y=-2x+10$

5. The line $y = -5x - 1$ is dilated by a scale factor of 2 and centered at the origin. Write an equation that represents the image of the line after the dilation.

$m=-5$
$b=2(-1)=-2$ $\quad y=-5x-2.$

6. The line $y = 2x - 4$ is dilated by a scale factor of $\frac{3}{2}$ and centered at the origin. Which equation represents the image of the line after the dilation?

1) $y = 2x - 4$
2) $y = 2x - 6$
3) $y = 3x - 4$
4) $y = 3x - 6$

$m = 2$

$b = \frac{3}{2}(-4) = -6$ $\quad y = 2x - 6$

7. The equation of line h is $2x + y = 1$. Line m is the image of line h after a dilation of scale factor 4 with respect to the origin. What is the equation of the line m?

1) $y = -2x + 1$
2) $y = -2x + 4$
3) $y = 2x + 4$
4) $y = 2x + 1$

$2x + y = 1$

$-2x \quad -2x$

$y = -2x + 1$

$m = -2$

$b = 4(1) = 4$ $\quad y = -2x + 4$

8. The equation of line a is given by the equation $y - 3x = 4$. Line b is the image of line a after a dilation with a scale factor of 3 with respect to the origin. Write an equation for line b.

$y - 3x = 4$

$+3x \quad +3x$

$y = 3x + 4$

$m = 3$

$b = 3(4) = 12$

$y = 3x + 12$

9. Line ℓ is mapped onto line m by a dilation centered at the origin with a scale factor of 2. The equation of line ℓ is $3x - y = 4$. Determine and state an equation for line m.

$-3x \quad -3x$

$-y = -3x + 4$

$-1 \quad -1$

$y = 3x - 4$

$m = 3$

$b = 2(-4) = -8$

$y = 3x - 8$

10. Line $y - 4 = 2(x - 2)$ is transformed by a dilation with a scale factor of 4 centered at the origin. What is the equation of the line's image?

$y - 4 = 2x - 4$

$+4 \quad +4$

$y = 2x$

$m = 2$

$b = 4(0) = 0$

$y = 2x$